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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/853,925	05/09/2001	Tak Kin Chu	82528	7226

7590

02/24/2004

OFFICE OF COUNSEL  
NAVAL SURFACE WARFARE CENTER  
DAHLGREN DIVISION  
17320 DAHLGEN ROAD  
DAHLGREN, VA 22448-5110

EXAMINER

KIELIN, ERIK J

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 02/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/853,925

Applicant(s)

CHU ET AL.

Examiner

Erik Kielin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 15-21 and 29-36 is/are pending in the application.
- 4a) Of the above claim(s) none is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 29,34 and 35 is/are rejected.
- 7) ☐ Claim(s) 15-21,30-33 and 36 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. This action responds to the Request for Reconsideration and the IDS, each filed 16 July 2004.

2. The rejection under 35 USC 112(1) is withdrawn because original claim 15 provides support for the claimed combination of metals in a single monolayer.

### *Double Patenting*

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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4. Claim 29 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 3 of U.S. Patent No. 6,083,818 in view of either of US 5,930,669 (**Uzoh**) and US 5,933,753 (**Simon et al.**).

Claim 3 of the '818 patent includes a barrier layer including a monolayer of strontium atoms with a conductor deposited thereon.

Claim 3 does not recite that the conductor is single crystal transition metal.

Each of **Uzoh** (Abstract; col. 2, lines 13-16) and **Simon** (col. 2, lines 21-31) teaches the benefits of depositing single crystal copper (a transition metal) on a barrier layer, the single crystal improving the structural integrity of the interfaces between metal layers.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to deposit a single crystal copper metal layer as the conductor in claim 3 of '818 patent to improve the structural integrity, as taught in each of **Uzoh** and **Simon**.

5. Claim 29 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 10 of U.S. Patent No. 6,211,066 in view of either of US 5,930,669 (**Uzoh**) and US 5,933,753 (**Simon et al.**).

Claim 10 of the '066 patent includes a barrier layer including a monolayer of barium atoms with a conductor deposited thereon.

Claim 10 does not recite that the conductor is single crystal transition metal.

Each of **Uzoh** (Abstract; col. 2, lines 13-16) and **Simon** (col. 2, lines 21-31) teaches the benefits of depositing single crystal copper (a transition metal) on a barrier layer, the single crystal improving the structural integrity of the interfaces between metal layers.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to deposit a single crystal copper metal layer as the conductor in claim 10 of '066 patent to improve the structural integrity, as taught in each of **Uzoh** and **Simon**.

6. Claims 29, 34, and 35 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 3 and 7 of U.S. Patent No. 6,566,247 in view of either of US 5,930,669 (**Uzoh**) and US 5,933,753 (**Simon et al.**).

Claim 3 of the '247 patent includes a barrier layer including a mixed monolayer of metal atoms selected from the group consisting of barium, cesium, strontium, and rubidium with a conductor deposited thereon. Claim 7 recites that the conductor is copper.

Claim 3 does not recite that the conductor is single crystal transition metal of copper, as further limited by instant claim 7.

Each of **Uzoh** (Abstract; col. 2, lines 13-16) and **Simon** (col. 2, lines 21-31) teaches the benefits of depositing single crystal copper (a transition metal) on a barrier layer, the single crystal improving the structural integrity of the interfaces between metal layers.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to deposit a single crystal copper metal layer as the conductor in claim 3 of '247 patent to improve the structural integrity, as taught in each of **Uzoh** and **Simon**.

7. Claims 29, 34, and 35 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 15 and 20 of copending

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Application No. 09/137,086 in view of either of US 5,930,669 (**Uzoh**) and US 5,933,753 (**Simon et al.**). This is a provisional obviousness-type double patenting rejection.

Claim 15 of the '086 application includes a barrier layer including a monolayer of cesium atoms with a conductor deposited thereon.

Claim 15 does not recite that the conductor is single crystal transition metal of copper -- as further limited by claim 20.

Each of **Uzoh** (Abstract; col. 2, lines 13-16) and **Simon** (col. 2, lines 21-31) teaches the benefits of depositing single crystal copper (a transition metal) on a barrier layer, the single crystal improving the structural integrity of the interfaces between metal layers.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to deposit a single crystal copper metal layer as the conductor in claim 15 of '086 application to improve the structural integrity, as taught in each of **Uzoh** and **Simon**.

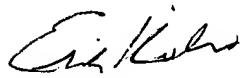
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 571-272-1693. The examiner can normally be reached on 9:00 - 19:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Erik Kielin  
Primary Examiner  
19 February 2004